deposit their eggs, and always put them as near to the centre as they can; and as soon as the maggots are developed, they eat their way to the interior, where they find the most food. There is no fear of the eggs being killed in the middle of the dead carcase. The flies put their eggs as far as they can into the meat or carcase, where they find moisture, which hastens their development. The eggs are not to be seen on the exterior part of a dead carcase, or on the outer part of a piece of meat of any kind; but the flies take care to put them in the hollow and moist places, where they soon hatch; and if you open the mouths of any dead animals, you may find the eggs in large quantities. When they deposit their eggs on a living sheep, they are close on the skin, where it is moist.

XVIII. *Contributions towards the Natural History of British* Microlepidoptera. *By* J. W. Douglas, Esq.— (*Continued from page* 81.)

[Read 6th December, 1852.]

Genus Lithocolletis, Zeller. (Pl. XIII.)

The perfect insects of this genus may be known at a glance by the slenderness of their structure, the smallness of the thorax, and the characteristic markings of the anterior wings. These latter are fine lines on the apical half of the wing, sloping from either margin towards the apex, frequently meeting on the disk, and forming angles more or less acute. The general similarity of many species has caused great difficulty in recognising their distinctive characters; but though by practice they become more easy to separate, yet the most satisfactory mode of determining them is to rear them from the caterpillar state. Zeller has observed (Linnæa Entomologica, i. 169), that on account of the cilia of the anterior wings being coloured and scaled like the wings themselves, the true form of the latter is only to be seen on the under side.

The larvæ have but fourteen feet, the fourth ventral pair being absent; the whole body is flattened, the head small, and the three thoracic segments generally much widened; this last fact being the more remarkable when contrasted with the narrow

thorax of the perfect insect. These larvæ mine in the leaves of many plants; some species on the upper and some on the underside; each kind, however, keeping invariably to one side, and having its own characteristic method of working, and each individual passing its whole life in one leaf. When first the larva begins to feed on the parenchyma, it loosens the cuticle, which on this spot then appears as a whitish film: it soon, however, contracts into folds, the colour becomes darker, and as the hollowing process proceeds beneath it, the leaf contracts, and curves, more or less, forming a spacious tenement for the miner, whose age may be known by the appearance of its dwelling. The means by which it accomplishes its purpose have been described by Reaumur (*vide ante*, p. 102.) Of many, perhaps of all species, there are two broods in a year.

When about to change to a pupa, the body of the larva becomes contracted, and of a clearer colour, having been cleansed of all remains of food. The change always takes place within the mined place; in some cases, within a silken cocoon, made by the larva; in others, the pupa is loose. When the imago escapes, the pupa-skin is left projecting through the skin of the leaf.

The characters of the genus are laid down by Zeller, in the "Linnæa Entomologica," (Band. I., 167, 1846); and descriptions are given of all the then known species. In Curtis's "British Entomology," all the British species are placed in the genus *Argyromiges*, but unfortunately the author has drawn its characters from *autumnella* (*T. Clerckella*, L), which differs from the species with which it is there associated, in the form and neuration of its wings, in the enlarged basal joint of the antennæ, in the larva having sixteen feet, and in its habit of quitting the leaf it has mined, previous to forming its suspended cocoon, so that it cannot stand as the representative of a genus whose larvæ have but fourteen feet, and change to the pupa state within the substance of leaves.

Lithocolletis trifasciella, Haworth, Stainton. (Zool. 2088.)

Larva (Pl. XIII. fig. 1 *a*).—Length $2\frac{1}{2}$ lines.—Citron yellow, shining, transparent, hairy, with a green dorsal stripe. Head of a more dull yellow, mouth brown. Six pectoral, six ventral, and two anal legs yellowish. The upper surface of the segment bearing the last pair of ventral legs is orange.

Mines the underside of the leaves of honeysuckle (*Lonicera periclymenum*), the skin of which it wrinkles and detaches, forming a small pouch, in which it lives and feeds on the

parenchyma. Soon the leaf begins to curve, and eventually it becomes so much twisted, that the apex approaches the base, and again turns upwards. (Pl. XIII. fig. 1 *b*.)

Pupa brown, with several curved light brown hairs, and a short anal spine. Formed loose in the mined place.

Imago (Pl. XIII. fig. 1).—The first brood of caterpillars occurs in March and April, producing moths in May; the second appears in June, perfecting themselves in July; and a third is found in September and October, transforming to the perfect state in October and November.

This species is not rare in woods and hedges near London; but Mr. Stainton tells me, that in the hedges of Devonshire it is not uncommon to find every leaf on a young shoot of honeysuckle, four or five feet in length, tenanted by a larva.

Lithocolletis Scabiosella. Douglas, n. sp. (Pl. XIII. fig. 2.)

Alis anticis saturatè croceis, *nitidis*, lineola basali alba, strigis tribus introrsus nigro-marginatis, strigulaque apicali argenteis, macula obliqua pone strigam tertiam, apiceque nigris. Exp. alar. $3\frac{1}{2}$—4 lin.

Head and thorax concolorous with the anterior wings, face whitish, antennæ black, narrowly annulated with whitish. Anterior wings rich deep saffron, *very glossy*, with a fine, very short white basal streak: three equidistant bright silvery strigæ, margined interiorly with black; the first nearly straight; the second angulated in the upper half; the third composed of two long opposite spots, broad on the margins of the wing, and meeting with pointed apices on the disk, but curving outwards, and forming an angle; two other white spots form a short apical striga, the apex itself and a long oblique spot, stretching from the third striga to the anal angle, being black. Cilia concolorous with the wings. All the tarsi broadly annulated black and white.

Most nearly allied to *L. trifasciella*, the white markings of the anterior wings being almost identical in form; but the dark margins of the three strigæ are much narrower, and of a more uniform width; the ground colour of the wings is much darker, the whole surface is more glossy; the strigæ especially being conspicuous by their bright silvery hue, and the average size is a trifle less than in that species.

Larva (Pl. XIII. fig. 2 *a*).—Length $2\frac{1}{2}$ lines.—Light yellow, with short hairs of the same colour, and a dark dorsal line. Head small, of a light testaceous colour; thoracic segments

widened, the others gradually tapering to the extremity of the body. Six pectoral, six ventral, and two anal legs the colour of the body.

Feeds in the radical leaves of *Scabiosa Columbaria* (Pl. XIII. fig. 2 *b*), mining on the underside, detaching the epidermis, which becomes wrinkled in longitudinal folds ; the upper surface becomes convex in consequence, but preserves its colour.

Pupa light brown, with a few very fine hairs, and a stout anal spine.

There are two broods in a year. I first found the larvæ, very small, on the 9th of April, 1852, at the side of the old tram-way beyond Croydon, and they were perfected at the end of May. The second brood of caterpillars appeared in July, and the moths in August.

This is the only species of this genus whose larvæ are known to feed upon a herbaceous plant, all the others being found on the leaves of trees and shrubs.

Lithocolletis Emberizæpennella, Bouché, Zeller. (Lin. Ent. i. 241.)

Larva (Pl. XIII. fig. 3 *a*).—Length 3 lines.—Greenish white, widest in the centre, tapering a little to each end ; thus differing from all other known larvæ of this genus, inasmuch as in them the thoracic segments are widest. Herr v. Nicelli has noticed this peculiarity in his paper on *Lithocolletis*, in the "Entomologische Zeitung," for 1851 (translated by Mr. Stainton, Zoologist, App. clxiii). Head pale greenish, margins and mouth brown. Six pectoral, six ventral, and two anal legs, the colour of the body. Mines the underside of the leaves of honeysuckle (*Lonicera periclymenum*), making a *large cavity* (Pl. XIII. fig. 3 *c*), in consequence of which a large fold downward of the leaf occurs, and the cuticle appears white on the upper side, but the leaf does not twist round at right angles, as in the case of *L. trifasciella*. Found in July and September.

Pupa (Pl. XIII. fig. 3 *b*).—Light brown, robust ; obtuse at the head and tapering to the other end, on which is no spine, but a scarcely visible blunt prolongation. There are a few hairs along the whole extent, and projecting from under the head towards the side, apparently from the margin of the next segment, are two stout hairs, or spines, curving outwards. The covers of the antennæ are longer than the wing cases, but the pair of hind legs along which they are laid are still a little longer, and all are joined together in one piece, which at the apex is free from the body.

(The figure was made from a specimen from which the moth was about to emerge, and the markings on the wings are seen through their cases.) The pupa is formed within the mined place, in a dark greenish brown, bluntly pointed, oval cocoon, of silk (Pl. XIII. fig. 3 *d*), which is either loose or slightly attached to the leaf.

Imago (Pl. XIII. fig. 3).—Found in May and August.

Genus Gracillaria, Haworth. (Pl. XIV.)

The most striking characteristics of this genus are the general slenderness, the length of the antennæ, the length and narrowness of the anterior wings, the development of the maxillary as well as the labial palpi, and the position of the moths in repose—sitting with the fore legs advanced, the head elevated, the antennæ laid back under the wings, and the apices of the anterior wings touching the surface on which they sit. Haworth has briefly characterised the genus (Lep. Brit. 527, 1828); Zeller more fully (Lin. Ent. ii. 313); and also Stainton (Trans. Ent. Soc. i. N. S. 115). Mr. Curtis has given the characters, founded on dissections of *G. Syringella*, of which he has also figured the preparatory states (Brit. Ent. Pl. 479).

The larvæ feed on the leaves of various plants, probably all the species in the first instance, as miners; then each rolls a leaf into the form of a cone, at least the greater number of species do so, and feed within it. Some species are always miners. These larvæ have but six ventral legs.

The pupa is enveloped in a cocoon.

Gracillaria Franckella,, Hübner, Zeller, Stainton. (Trans. Ent. Soc. i. N. S. 118.)

Larva (Pl. XIV. fig. 1 *a*).—Length 3 lines.—Greenish white, semi-transparent, slightly hairy, the dark green of the dorsal vessel showing conspicuously through. Head yellowish, the mouth and two spots on the inferior side brown. The six pectoral, six ventral, and two anal legs the colour of the body. Curls up the end of one of the lobes of leaves of the oak (Pl. XIV. fig. 1 *b*), in which it feeds, discolouring its habitation, and removing to other leaves several times in succession. Found in August, September, and October.

Pupa, in a cocoon attached to a leaf.

Imago (Pl. XIV. fig. 1).—Found in September and October, and hybernated specimens from April to June.

Gracillaria stigmatella, Fabricius, Zeller, Stainton. (Trans. Ent. Soc. i. N. S. 120.)

Larva (Pl. XIV. fig. 2 *a*).—Length 3½ lines.—Greenish white, head yellowish, with two brown spots at the side; jaws brown; short white hairs on the whole length. The six pectoral, six ventral, and two anal legs are of the same colour as the body. Feeds on the leaves of sallows, poplars, and willows, rolling and fastening up the ends into the form of a cone (Pl. XIV. fig. 2 *b*), within which it lives, consuming the portion rolled up; taking care, however, not to destroy the outer epidermis. This soon becomes discoloured, and when the supply of food is exhausted, the larva removes, and makes another similar habitation, and so on several times in succession. Found in August, September, and October.

Pupa, in a cocoon attached to a leaf (Pl. XIV. fig. 2 *c*).

Imago (Pl. XIV. fig. 2).—Found in September and October, and hybernated specimens in March and April.

Gracillaria auroguttella, Stephens, Stainton. (Trans. Ent. Soc. i. N. S. 187.)

Larva (Pl. XIV. fig. 3 *a*).—Length 2½ lines.—Pale whitish green, slightly shining, with short hairs on its whole length. The dorsal vessel shining through, of a dark green colour. The six pectoral, six ventral and two anal legs are of the colour of the body. Head pale brown.

It first mines the leaves of *Hypericum perforatum* and *H. humifusum* in the centre, and as the gallery increases in length and width (though it never becomes very wide), the under side of the leaf is contracted, and the edges turn down. After living as a miner until the gallery is one-third or half an inch in length, it quits it and turns down the end of a leaf in a conical shape (Pl. XIV. fig. 3 *b*), and feeding within, the cone at first green, soon becomes whitish, and then brown, and it removes and forms several of these habitations in succession, each larger than the previous one. When full fed, it rolls a leaf no longer across and conically, but lengthwise, and as a tube; and this (soon becoming brown) resembles a miniature cigar (Pl. XIV. fig. 3 *c*). In this, after spinning a closely fitting silken web, it becomes a pupa (Pl. XIV. fig. 3 *d*). There are two broods in a year; the first in the beginning of July, producing perfect insects in August; the other in October, remaining all winter in the pupa state, and transforming in May.

Imago (Pl. XIV. fig. 3).